legs showed signs of atrophy. In a number of them, however, an egg could be seen through the body wall. This is an interesting fact in view of previous investigations by the author (5) on a mite *Hemitarsonemus latus* (Banks) belonging to the same family. It was suggested in that paper that the female is fertilised by the male before she reaches maturity and evidence was given in support of this suggestion. It would appear that this aspect of the life history of *P. locustanus* n.sp. would repay investigation and might be found to exhibit a close resemblance to the corresponding phase of the life-history of *H. latus* (Banks).

Summary.

In this paper an attempt is made to give a summarised account of our knowledge of the locust infesting acari of South Africa A record is given of a form of *Proctotydaeus*, occurring on a South African acridid and the opinion is expressed that it may prove to be a new species. A full account of the known South African species of *Podapolipus* follows, together with a general consideration of the genus.

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Studies on South African Thysanoptera — II.

by

C. JACOT-GUILLARMOD.

The types of all new species described in this paper are in the author's collection. The figures were drawn by the author with the aid of a camera lucida.

Chirothrips hoodi sp.n. (Figs. 1 and 2).

Female (macropterous). Length about 1.2 mm. General colour yellowish brown. Head brown with a very slight tinge of yellow; the entire thorax and abdomen paler and more distinctly tinged with yellow; femora same colour as the thorax on the outer margin, the rest more yellow; fore tibiae yellow except for the outer portion of the basal angle, middle and hind tibiae yellowish brown gradually becoming more yellow towards the apex which is practically pure yellow; all tarsi yellow. Antennal segment I brown, the same shade as the head; II brownish yellow at the base and gradually becoming more yellow apically; III yellow; IV brownish yellow; V-VIII brown with V slightly paler than the rest. All setae tinged with brown. Fore wings distinctly shaded with greyish brown, hind wings practically colourless. Ocellar pigmentation red.

Head with its total median length about 1.04 times its greatest width which is across the eyes and 0.7 as long as pronotum, hardly produced at all in front of the eyes; surface with a few fairly distinct striae behind the posterior ocelli; frontal costa acutely produced and not notched; vertex normally with two pairs of setae, the outer pair minute, between the base of the antennae and the anterior portion of the eyes, the inner pair larger (about 7 μ long), closer together and placed caudad to a line forming a tangent with the anterior margin of the eyes; interocellar setae about 16 μ long, placed just caudad to a line forming a tangent with the hind margin of the anterior ocellus and about 28 μ apart; three minute pairs of setae on the hind margins of the eyes and a similar lateral pair more or less in line with them. Eyes rather large and well rounded, about 0.57 the length of the head, in the holotype with dorsal length 66 μ, dorsal width about 33 μ and dorsal interval about 46 μ. Ocelli normal, the median one about 8 μ in diameter and 59 μ from anterior end of head, the posterior pair about 9 μ in diameter, 28 μ apart and 16 μ from the median ocellus. Antennae normal, segment I well rounded, II with an acute production, the outer margin straight and then curving back near the apex of the production which has no apical seta, setae distributed as in figure, median length of this segment 33 μ, length of outer surface 47 μ and maximum diagonal length 57 μ, distance from tip of projection to pedicel of III 26 μ; III about 1.28 times as long as wide, slightly longer than IV which is about 1.25 times as long as its own width; VII about 0.7 the length of VIII; sense cones stout and simple, that on outer margin of V present but small. Mouth cone broadly rounded, its length beyond the posterior dorsal margin of the head being 95 μ; maxillary palpi three-segmented.

Prothorax about 1.3 times as wide (at its widest) as long and about 1.4 times as long as the head; the width at the hind angles about 1.3 times as wide as that at the anterior angles; pronotum with lines of sculpture weak, not forming scallops; setae at the posterior angles 43-50 μ in length. Pterothorax normal, metascutum with the usual two pairs of setae close to the anterior margin, the median pair slightly more caudad and about 37 μ long; metascutellum somewhat less than three times as wide as long; mesosternum nearly smooth, without dark elevated scallops in the region of its anterior angles. Legs normal; fore femora and tibiae distinctly sculptured. Wings nearly straight, the fore pair with 3 + 3 setae near base of anterior vein and 1 +1 beyond, the hind vein with 4-5 setae.

Abdomen broader than either the meso- or the metathorax; lines of sculpture on the dorsal surface rather indistinct; subbasal sclerotised line on terga I and II broken up into dashes, on the other terga appears to be continuous, but actually made up of long dashes which are separated by indistinct breaks; posterior margins of terga produced into thin, indistinct lobulate flanges and not into teeth or scallops; segment X about 74 μ long and with its greatest subbasal width 69 μ, setae normal, segment IX in holotype with setae 1-3 about 97 μ, 113 μ and 97 μ respectively; X with 1 and 2 about 103 μ and 88 μ respectively.

Measurements of female (holotype) in mm. — Length about 1.167, head, total length 0.116, width across eyes 0.113, greatest width across cheeks 0.111, length in front of eyes 0.030, length of cheeks 0.028, interval between base of antennae 0.008; prothorax, median length of pronotum 0.164, greatest width 0.212, width at anterior margin 0.125; mesothorax, greatest width 0.243; metathorax greatest width 0.210; fore wings, length 0.744, width at middle 0.037; abdomen, greatest width 0.256.

Antennal segments . . .	1	2	3	4	5	6	7	8
Length in μ	22	33	32	30	26	42	11	16
Width in μ	34	—	25	24	21	21	8	5

Total length of antenna 0.212 mm.

Male (macropterous) Length 0.98 mm. General colour somewhat similar to that of the female; head brown with a yellowish tinge, the thorax and abdomen pale brownish yellow with the following exceptions: sides of the mesothorax somewhat darker and the abdominal segments IX and X yellowish brown, slightly more yellow than the head. Legs and antennae similar to those of the female but paler and in the antennae segment II nearly the same shade as III.

In structure, except for sexual characters, very similar to the female, but distinctly smaller. Head 1.07 times as long, along its total median length, as wide across the eyes, which in the Marico male is the same as that across the cheeks; head production similar to that of the female; only one seta present, on the left side of the vertex between the base of the antenna and the anterior margin of the eyes; antennae similar to those of the female; ocelli present, the median one 49 μ from the anterior end of the head, the posterior pair 22 μ apart and 16 μ from the median ocellus. Mouth cone extending about 76 μ beyond the posterior dorsal margin of the head. Prothorax about 1.3 times as broad as long and 1.33 times as long as the head; setae at posterior angles 32 μ long. Wings fully developed, 611 μ long and about 37 μ wide at the middle, fore vein with 3 + 3 basal setae and 3 beyond (1 + 2), hind vein with 6 setae. Glandular areas on segments III-VII rather large and oval, that on III about 74 μ across. Lateral setae on segment IX about 77 μ in length.

Measurements of male (allotype) in mm. — Length 0.988 (somewhat distended); head, total length 0.104, width across eyes 0.097, greatest width across cheeks 0.097, length in front of eyes 0.024, length of cheeks about 0.024; prothorax, median length of pronotum 0.138, greatest width 0.184, width at anterior margin 0.118; mesothorax, greatest width 0.215; metathorax, greatest width 0.187; abdomen, greatest width 0.220.

Antennal segments . .	1	2	3	4	5	6	7	8
Length in μ	18	28	26	24	22	40	9	15
Width in μ	29	—	24	22	18	17	7	5

Total length of antenna 0.182 mm.

Transvaal: Rietspruit, Marico, 13-I-1930, *J. C. Faure*, on grass, 3 females and 1 male; Pretoria, 27-IV-1930, *J. C. Faure*, on grass, 1 male (paratype); Wonderkloof, Nelspruit, 23-I-1939, *W. Powell*, on *Hyparrhenia filipendula* (Hochst.) Stapf., 1 female and 1 male (paratypes).

This species appears to be closely related to *C. aculeatus* Bagnall and *C. meridionalis* Bagnall, the latter having, at least in Egypt, a macropterous male. These two species may easily be separated from the new one: they have the outer sense cone on the outer surface of segment IV distinctly forked whereas in *hoodi* it is without doubt simple. This simple sense cone is sufficient to separate the new species from Bagnall's two forms, without mentioning other differential characters.

I take pleasure in dedicating this species to Dr. J. D. Hood, whose fine work on Thysanoptera has always been a great inspiration to me.

Key to the known species of *Exothrips* Priesner.

Males.

1a. Large and dark seta present at the inner apex of antennal segment I 2
b. Seta on inner apex of antennal segment I colourless and weak . . 3

2a. Segment IV of antenna black, antennal segment I larger, 59 μ long and 1.31 times as long as wide . . . . *monstrosus* Priesner.
b. Segment IV of antenna pale brown; antennal segment I shorter, 45 μ long and 1.10 times as long as wide . . . . . *setosus* sp.n.

3a. Underside of head with no dark brown patch; antennal segment VI uniformly brown; III longer than II and 1.5 times as long as wide . . . . *navicularius* sp.n.
b. Underside of head with a distinct dark brown patch; antennal segment VI brown at apical half and of a yellowish colour for the basal half; III shorter than II and about 1.17 times as long as wide *pulcher* sp.n.

Females.

1a. Ovipositor shorter, not more than 300 μ in length; antennal segment VI completely dark 2
b. Ovipositor longer, over 320 μ in length; antennal segment VI distinctly paler for about its basal half . . . . . . *pulcher* sp.n.
2a. Ovipositor shorter, 248-268 μ long 3
b. Ovipositor longer, 283-300 μ long . . . . . . *navicularius* sp.n.
3a. Antennal segments broader, III 1.25 times as long as wide and IV 1.4 . . . . *setosus* sp.n.
b. Antennal segments narrower, III 1.45-1.55 times as long as wide and IV 1.7 . . . . *monstrosus* Priesner.

Exothrips setosus sp.n. (Fig. 3).

Male (macropterous). Length about 0.80 mm. General colour yellow throughout except for the sides of the tenth abdominal segment which are slightly darker; the tip of the labrum which is dark brown; the antennae coloured as follows: I yellow, somewhat darker towards the base; II washed with grey; III almost colourless at base and washed with pale brown for about the apical half; IV and V pale brown; VI pale brown for a little more than the basal half, the rest slightly darker and the same colour as VII and VIII. Fore wing slightly washed with grey and hind wing hyaline except for a dark line running throughout its length excepting at its extreme apex. All setae colourless except for the prominent antennal setae which are dark; the two spines on abdominal segment IX dark.

Head distinctly wider than long, widest across eyes where it is about 1.44 times as wide as long (it is rather difficult to measure the length accurately as the head is retracted into the prothorax) and 0.59 times as long as the prothorax; hardly if at all produced in front of eyes; cheeks evenly rounded and distinctly converging towards the base of the head; occiput with widely separated cross-striae which cause a serration of the cheeks; vertex with three pairs of setae, two near the anterior angles of the eyes and the third median, near the base of the antennae, these being 20 μ apart and about 8 μ in length; interocellar setae 13 μ long and 28 μ apart placed in a line connecting the median ocellus to each posterior ocellus respectively, only about 5 μ from the latter. Eyes about 0.59 the length of the head, prominent, measuring approximately as follows in μ: dorsal length 53, width 34, interval 66. Ocelli normal with a diameter of about 8 μ, the median one with its anterior margin about 15 μ behind that of the eyes, the posterior pair about 34 μ apart and 21 μ from the median one. Antennae eight-segmented, about 2.32 times as long as head; segment I large, longer and wider than any other segment, with a large seta (58 μ long) near its inner apical angle; II normal, prominent seta 36 μ long; III with prominent setae on inner margin 28 μ in length; IV only slightly concave on inner surface where there are two prominent spines, the ventral one being 24 μ long; sense cones on III and IV distinctly forked from the base; the shape and chaetotaxy of the antennae as shown in the figure. Mouth cone extending about 84 μ beyond the posterior dorsal margin of the head; maxillary palpi three-segmented.

Prothorax about 1.05 times as wide as long (probably due to pressure and normally would be longer than wide), pronotum lightly sculptured throughout with fine cross-striae; postero-angular setae not conspicuous, about 24 μ in length, the posterior margin with four pairs of subequal setae. Pterothorax normal, nearly smooth, mesothorax distinctly and metathorax only somewhat wider than prothorax, both being wider than the abdomen. Fore wings about 616 μ long and 32 μ wide at the middle, more or less straight, setae rather weak, the costa with 23 setae, anterior vein with 3 + 3 at the base and 3 beyond, the hindvein with 4 setae. Fore legs somewhat enlarged, femora unarmed, the fore tibiae armed with a distinct sharp tooth at the inner apical angle; middle and hind legs normal.

Abdomen about 1.11 times as wide as the prothorax; the hind margins of terga produced into outwardly pointed teeth similar to those found in *Perissothrips* Hood; on tergum IX two closely placed sharp spines 22 μ long, originating from heavily sclerotised basis; longest seta on IX about 55 μ, while that on segment X at least 132 μ long. There are no sense areas visible on any of the sterna nor are there any microtrichinae visible on the sub-apical sterna.

Measurements of male (holotype) in mm. — Length about 0.80; head, total length about 0.090, width across eyes 0.130, greatest width across cheeks 0.121; prothorax, median length of the pronotum 0.154, greatest width 0.161; mesothorax, greatest width 0.207; metathorax, greatest width 0.184; abdomen, greatest width 0.179.

Antennal segments . .	1	2	3	4	5	6	7	8
Length in μ	45	29	28	29	26	33	8	11
Width in μ	41	23	20	21	21	17	6	5

Total length of antenna 0.209 mm.

Female (macropterous). Length about 1.05 mm. In colour the female is very similar to the male; in contrast to the other known species of the genus there is no striking difference in the colour of the antennae. Antennal segment I pale yellow; II pale yellow shaded with pale brown; III pale yellow; IV pale yellow tinged with pale brown especially at the apex; V-VIII brown, V somewhat paler at the base. Abdominal segment X brown, sometimes paler at its extreme base.

In structure the female is also somewhat similar to the male, the only striking difference being in the normal and not enlarged antennal segment I and the antenal segments not having greatly enlarged setae; the large seta on I in the male is represented by a distinct but much shorter and weaker one. The head is about 1.5

times as wide as long and somewhat more than half the length of the prothorax which is slightly wider than its own length. Both the meso- and metathorax are wider than the prothorax and the abdomen is about equal to the mesothorax in width. The longest setae on abdominal segments IX and X are about 102 and 90 μ in length, respectively. The ovipositor is about 266 μ in length, or somewhat shorter; abdominal segment X is about 74 μ in length.

Measurements of female (allotype) in mm. — Length about 1.056; head, total length 0.079, width across eyes 0.116, greatest width across cheeks 0.108; eyes, length 0.053, width 0.029, interval 0.058; prothorax, median length of pronotum 0.134, greatest width 0.140; mesothorax, greatest width 0.194; metathorax, greatest width 0.166; abdomen, greatest width 0.194.

Antennal segments . .	1	2	3	4	5	6	7	8
Length in μ	24	29	25	28	33	37	7	11
Width in μ	26	25	20	20	18	17	7	5

Total length of antenna 0.194 mm.

Transvaal: Woodbush, Pietersburg, 15-IV-1924, *J. C. Faure*, in "sweepnet", 1 male (holotype). Wonderkloof, 23-I-1939, *W. Powell*, Jnr., on H.P. II, 1 female (allotype), 1 male and 8 females (paratypes).

This species may be separated from the two species described below and from *monstrosus* Priesner, the only species previously known, by the paler antennal segments IV and V, which do not strongly contrast with the rest of the segments. It appears to be most closely related to *monstrosus*, from which species it is rather difficult to separate by the description alone, except for the character given above. Another character which seems to separate these two species is the size of segment I of the antennae, this being much larger in *monstrosus*, 59 μ long and 1.31 times as long as wide compared with 45 μ long and 1.10 times as long as wide in the present species. In the female the present species may easily be separated from *monstrosus* by the broader antennal segments, as shown in the key.

Exothrips pulcher sp.n. (Figs. 8, 9, 10).

Male (macropterous). Length about 1.10 mm. General colour pale yellow. Head pale yellow throughout; prothorax yellow, darker than head; pterothorax yellow, more or less the same shade as the head; abdomen pale yellow the same shade as the head at the base whence it becomes slightly darker caudad, with segment IX distinctly brown, contrasting with the rest of the body. All legs pale yellow, the femora slightly darker on the outer margin. The antennae as follows: segments I and II pale yellow with an ochreous tinge; III, pale yellow only on the narrowed basal portion, the rest distinctly shaded with brown, darkest at the apex; IV and V very dark brown, contrasting strongly with the rest of the antenna; VI brown for the apical third or half, the rest yellow except the base which is also brown; VII and VIII brown. All setae colourless except the long dorsal seta on antennal segment III and the thick spines on IV which are tinged with brown. Ocellar pigmentation red.

Head much broader than long, widest across the eyes where it is about 1.31-1.49 times as wide as its total length, which is about 0.5 the length of the pronotum, slightly produced in front of the eyes, the produced portion laterally about 8-10 μ in length; cheeks evenly rounded and converging to the base of the head; occiput with distinct but rather weak cross lines arising at about the middle of each cheek and continuing medianly but becoming very faint, to near the base of the posterior ocelli; the strongest cross line dividing the occiput into a comparatively smooth anterior portion and more distinctly cross-striated posterior portion; vertex possessing only two pairs of setae, one at the anterior angles of the eyes and a median pair about 15-17 μ apart and 16 μ in length, placed near the base of the antennae; interocellar setae about 16 μ in length and 15-22 μ apart, placed more or less in a line forming a tangent with the internal surface of the posterior ocelli and the lateral surface of the median ocellus and about 8 μ from the former. Eyes about 0.6 the length of the head, prominent, about 50 μ in length in the holotype. Ocelli normal, about 9 μ in diameter, the median one with its anterior margin about 6 μ behind that of the eyes, the posterior pair about 36 μ apart and 20 μ from the median one. Antennae eight segmented, about 2.7 times as long as the head, segment I the largest of the segments, with apical setae 24-28 μ in length; III shorter than II, about 1.17 times as long as wide, abruptly narrowing down to the style, long dorsal seta about 42-47 μ in length; seta on II about 24-26 μ in length; IV concave or flat on the inner surface, and distinctly convex on the outer margin, with two prominent, practically straight spines near the apex, the ventral one 21-25 μ in length. Sense cones on segments III and IV forked from the base. Mouth cone extending about 111 μ beyond the dorsal hind margin of the head; maxillary palpi three-segmented.

Prothorax longer than wide, practically twice as long as the head and about 1.18 times as long as its own greatest width; pronotum smooth except for fine cross-striae at its base; postero-angular setae about 24-26 μ in length; posterior margin of the pronotum with four pairs of setae. Pterothorax normal, both the meso- and the metathorax wider than the prothorax but narrower than the abdomen. The fore wing in the holotype about 667 μ long and 34 μ wide at about the middle, more or less straight, having the following number of setae: costa about 25, fore vein 3 + 3 (very rarely 4 + 3) on basal half and 3 beyond, hind vein 4. Fore legs somewhat enlarged, the tibiae armed with a sharp tooth at the apex on the inner surface; middle and hind legs normal.

Abdomen about 1.45 times as wide as the prothorax; the hind margin of terga IV-VII produced into outwardly pointed teeth similar to those of *Perissothrips* Hood, tergum VIII produced into indistinct lobes instead of teeth; on tergum IX two closely placed spines (26-32 μ long) present, arising from a strongly sclerotised base. Longest seta on segment IX about 53 μ in length and the longest on X about 148 μ in length; no sense areas present on any of the sterna but with irregular cross rows of microtrichiae on VI-VIII.

Measurements of male (holotype) in mm. — Length (distended) 1.200; head, total length 0.088, width across eyes 0.130, greatest width across cheeks 0.118; prothorax, median length of pronotum 0.174, greatest width 0.148; mesothorax, greatest width 0.192; metathorax, greatest width 0.166; abdomen, greatest width 0.214.

Antennal segments . .	1	2	3	4	5	6	7	8
Length in μ	58	29	28	40	26	38	8	11
Width in μ	41	25	24	22	22	18	7	5

Total length of antenna 0.238 mm.

Female (macropterous). Length about 1.2 mm. In general colour the female is very similar to the male except in the striking difference in the antennae, which have segments I-III very pale yellow, I the palest; IV pale yellow with a very slight pale brown tinge throughout; V the same shade as IV except the apex which is distinctly shaded with brown: VI brown for about the apical half, the rest pale yellow except the extreme base which is distinctly shaded with brown; VII and VIII brown. Abdominal segment IX brown for about its apical half.

Chirothrips hoodi sp.n.
Fig. 1. Head and prothorax of female (holotype).
2. Left antenna of female (holotype).

Exothrips setosus sp.n.
Fig. 3. Right antenna of male (holotype)

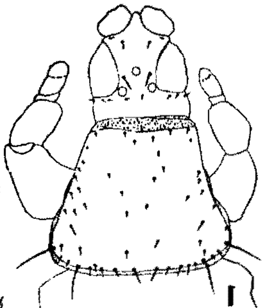
Exothrips navicularius sp.n.
Fig. 4. Head and prothorax of male (holotype).
5. Head and prothorax of female (allotype).
6. Left antenna of male (holotype).
7. Left antenna of female (allotype).

Exothrips pulcher sp.n.
Fig. 8. Head and prothorax of male (holotype).
9. Right antenna of male (holotype).
10. Right antenna of female (allotype).

Haplothrips bedfordi sp.n.
Fig. 11. Head and prothorax of female (holotype).
12. Right antenna of female (holotype).

Elaphrothrips laticornis sp.n.
Fig. 13. Head and prothorax of male (allotype).
14. Left antenna of male (allotype).

(Jac.-Guil. del.)



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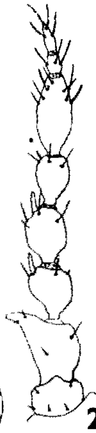

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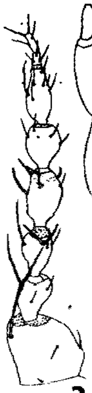

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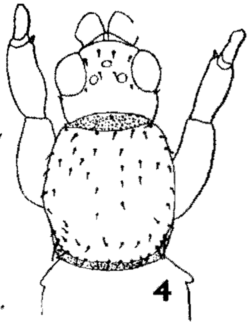

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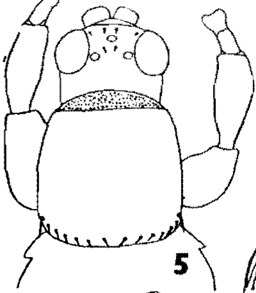

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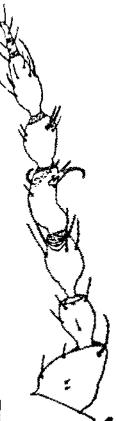

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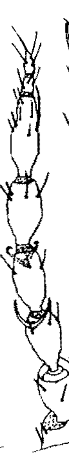

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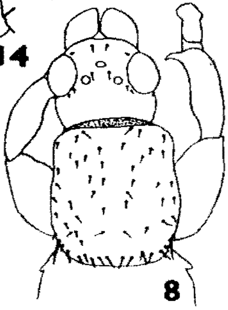

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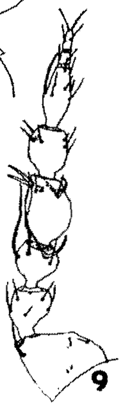

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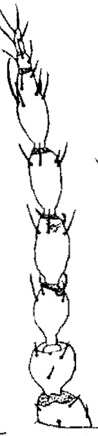

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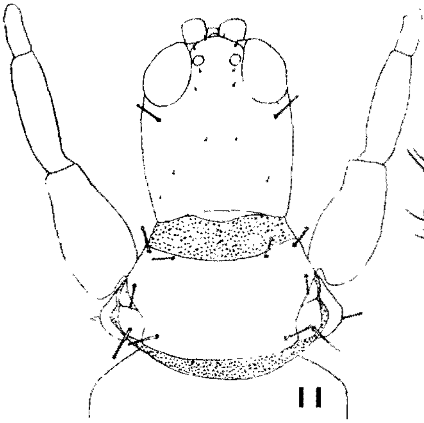

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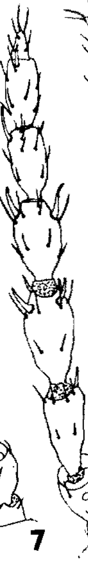

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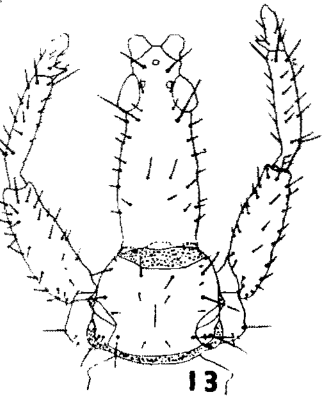

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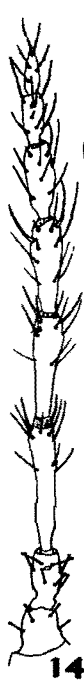

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In structure the female is also somewhat similar to the male except for the usual sexual differences and the striking difference in the antennae, these having segments of normal shape, segment III about 1.57 times as long as wide, shorter than IV which is 1.85 times as long as wide and slightly longer than V; VI distinctly the longest segment, 2.65 times as long as wide. Head similar to that of the male. Postero-angular setae of the prothorax somewhat longer, about 29 μ long. Wings longer, the fore pair about 733 μ long and about 40 μ wide at the middle. Abdomen long and narrow, segment X dorsally divided to the base and about 97-101 μ in length. Ovipositor well developed, about 322-344 μ in length. Longest seta on segment IX about 125 μ and that on X about 102 μ in length.

Measurements of female (allotype) in mm. — Length (distended) 1.256; head, total length 0.101, width across eyes 0.130, greatest width across cheeks 0.117; eyes, length 0.063; prothorax, median length of pronotum 0.184, greatest width 0.164; mesothorax, greatest width 0.222; metathorax, greatest width 0.189; abdomen, greatest width 0.225.

Antennal segments . .	1	2	3	4	5	6	7	8
Length in μ	25	28	33	37	35	45	11	13
Width in μ	29	26	21	20	19	17	7	5

Total length of antenna 0.227 mm.

Described from 22 specimens, 8 males and 14 females, collected as follows: *Natal*: Hluhluwe, Zululand, February 1937, *C. Jacot-Guillarmod*, "grass sweepings", including male (holotype), female (allotype), 5 male and 5 female, paratypes. Hluhluwe, Zululand, 24-I-1937, *C. Jacot-Guillarmod*, on *Themeda triandra*, 1 male and 6 female, paratypes. *Portuguese East Africa*: Lourenco Marques, 8-VII-1936. *J. C. Faure* on *Dactyloctenium* sp., 1 male and 2 female, paratypes.

This species is the most distinct of the known species of the genus; all the species appear to be very close to each other but this one differs from all the others in having the antennal segment VI paler at the base, the long ovipositor in the female and the dark brown patch on the undersurface of the head in the male.

Exothrips navicularius sp.n. (Figs. 4-7).

Male (macropterous). Length about 0.9 mm. General colour pale yellow to yellow, the head, prothorax and pterothorax somewhat darker than the abdomen, the pterothorax darker than the rest laterally. Tip of labrum dark brown. Legs yellow. Wings hyaline, the fore pair with a very slight yellowish tinge. Antennal segments I and II very pale yellow; III the same colour as I or slightly darker; IV-VIII dark brown, strongly contrasting with the general colour of the insect. Ocellar pigmentation when visible red.

Head distinctly broader than long, widest across the eyes where it is about 1.38 times as wide as its total length which is about 0.6

the length of the prothorax, only very slightly produced in front of the eyes; cheeks evenly rounded and converging to the base of the head; the occiput with a distinct but not strong cross line arising at about the middle of each cheek, dividing the occiput into a comparatively smooth anterior portion and a posterior portion finely cross-striate, cheeks very feebly serrated; the vertex possesses only two pairs of setae, one near the anterior angles of the eyes and a median pair which has an interval of about 13 μ and the setae about 11 μ long; interocellar setae about 12-13 μ long and 18-20 μ apart, placed in a line (or slightly internally to it) forming a tangent with the outer margin of the median ocellus and the inner margin of the posterior ocelli, about 8 μ from the latter. Eyes about 0.60 the length of the head, prominent, measuring as follows in the holotype in μ: dorsal length about 53, width 33, interval 55. Ocelli normal with a diameter of about 10 μ, the median one with its anterior margin about 8 μ behind that of the eyes, the posterior pair about 32 μ apart and about 18 μ from the median ocellus. Antennae eight segmented and about 2.72 times as long as the head, segment I longer and broader than any of the following segments, about 1.38 times as long as wide; III about 1.5 times as long as wide; IV distinctly concave on the inner margin where there is one dorsal curved spine and a ventral straight spine measuring about 18 μ in length. Sense cones on III and IV forked from the base; all setae on antennae colourless, that on inner apical angle of I about 32 μ long, rather weak, that on II thin and about 23-28 μ long, the dorsal seta on III 37-43 μ in length. Chaetotaxy and shapes of segments is as shown in the figure. Mouth cone extending about 95-101 μ beyond the dorsal hind margin of the head; maxillary palpi three segmented.

Prothorax somewhat longer than wide (this is only shown in specimens that have no pressure due to coverglass; in those in which pressure is present the prothorax is broader than long); pronotum lightly sculptured throughout with fine cross-striae; postero-angular setae about 18-21 μ in length, posterior margin with four pairs of subequal setae. Pterothorax normal, nearly smooth, both meso- and metathorax wider than either the prothorax or the abdomen. The fore wing in the holotype about 622 μ long and 32 μ wide at the middle, more or less straight, costa with about 23 setae, fore vein with 3 + 3 basal setae and 3 beyond, hind vein with 4 setae. Fore legs somewhat enlarged, femora and tarsi unarmed while the tibiae are armed at the apex on the inner surface with a distinct sharp tooth; middle and hind legs normal.

Abdomen about 1.09 times as wide as the prothorax; the hind margins of the terga IV-VII produced into outwardly pointed teeth similar to those found in *Perissothrips*, VIII with somewhat rounded lobes instead of sharp teeth; on tergum IX, two closely placed spines (18 μ long) present, originating from strongly sclerocheeks, dorsal length about 79 μ, width 50 μ and interval 56 μ in the holotype, the dorsal and ventral length more or less equal. Ocelli normal, the median one in advance of the anterior margin of the eyes, the posterior ones with their hind margin very slightly in front of the middle of the eyes. Antennae with segment III distinctly asymmetrical, IV distinctly the longest of all the segments, VII and VIII rather closely united; sense cones distributed as follows on the outer (inner) margins: III 0(1), IV 2(2), V $1(1^{+1})$, VI $1(1^{+1})$, VII one on dorsum. Mouth cone rather pointed, extending about 111 μ beyond the posterior hind margin of the head.

Prothorax with median line of pronotum about 0.55-0.59 the length of the head and (including the coxae) 2.11-2.23 times as wide as long, its surface more or less smooth; all the usual setae present, knobbed and more or less of the same thickness, their lengths in μ as follows in the holotype: antero-marginals 28, antero-angulars 28, mid-laterals at least 16, epimerals 42, postero-marginals 36, coxals 21. Pterothorax distinctly broader than the prothorax across the coxae. Fore wings in holotype about 756 μ long, distinctly narrower near the middle where they are 31 μ wide and broadest near the apex (51 μ wide); 9-12 duplicated cilia present and all the basal setae knobbed, about 36-38, 30-32 and 47-49 μ long respectively and 28 and 20 μ apart. Legs normal, fore pair somewhat enlarged. fore tarsi unarmed.

Abdomen broadest at segment III, about 1.15-1.16 times as broad as the prothorax across the coxae; median tergite of segment I with a few fine inconspicuous reticulations; tube about 0.53-0.54 the length of the head, about twice as long as the greatest subbasal width and somewhat less than half as wide at the apex, sides of the tube straight beyond the slightly swollen base. Tergum VII as far as is visible has one pair of microsetae in the median region, lateral and posterior to the pores; on VIII it is very difficult to say with certainty, due to the internal pigment, but it appears that one pair is present. Setae on segment IX 82 μ long and the terminals 132 μ long.

Measurements of female (holotype) in mm. — Length about 1.867 (distended); head, total length 0.210, width across eyes 0.158, greatest width across cheeks 0.164, least width near base 0.148; prothorax, median length of pronotum 0.115, width (including coxae) 0.256; pterothorax, greatest width 0.274; abdomen, greatest width 0.296; tube, length 0.111, greatest subbasal width 0.058, least apical width 0.034.

Antennal segments . .	1	2	3	4	5	6	7	8
Length in μ	24	45	47	53	46	42	36	24
Width in μ	29	28	26	31	28	25	21	12

Total length of antenna about 0.317 mm.

Male (macropterous). Length about 1.3 mm. In colour essentially as in the female. In structure also similar to the female, differing in the usual male characters: more slender form, somewhat narrower antennae. Legs similar to those of the female, including the absence of a tarsal tooth. Wings with fewer duplicated cilia, 6-8 in number. Prothorax somewhat shorter, along the median line of the pronotum about 0.5 the length of the head.

Measurements of male (allotype) in mm., with a few additional ones in brackets of a paratype cleared in NaOH:—Length (distended) 1.367; head, total length 0.194, width across eyes 0.141, greatest width across cheeks 0.141, least width near base 0.125; eyes, dorsal length (0.076), width (0.041), interval (0.058); ocelli diameter (0.013), interval between posterior pair (0.028), their distance from median ocellus (0.020); post-ocular setae, length 0.021, interval 0.105, distance from eyes 0.011; mouth cone, length beyond posterior dorsal margin of head 0.063; prothorax, median length of pronotum 0.092, width (including coxae) 0.202; antero-marginal setae 0.017, antero-angular setae (0.020), mid-lateral setae (0.022), epimeral setae 0.033, postero-marginal setae 0.028, coxal setae 0.015; pterothorax, greatest width 0.215; fore wing, length 0.611, width at middle 0.029, greatest width near apex 0.040; subbasal setae of fore wing, lengths (a) 0.026, (b) 0.020, (c) 0.036, distances apart, (a-b) 0.025, (b-c) 0.017; abdomen, greatest width 0.194; tube, length 0.103, greatest subbasal width 0.047, least apical width 0.029; longest setae on segment IX, length 0.092; terminal setae 0.105.

Antennal segments . .	1	2	3	4	5	6	7	8
Length in μ	22	37	42	51	45	42	36	25
Width in μ	29	24	24	29	24	21	20	11

Total length of antenna 0.300 mm.

Transvaal: Rustenburg: described from 19 specimens collected by *E. Bedford* as follows: 3-V-1939, "predator on *Scirtothrips aurantii*", 1 female; 16-VI-1939 "on out of season Australian", 1 male; 23-I-1940, "found feeding on *Scirtothrips aurantii* larva on young orange shoots", 1 female (holotype); 26-I-1940, "on orange foliage", 1 female and 1 male; 7-II-1940, "predaceous, on orange foliage", 9 females and 1 male (allotype); 5-III-1940, "predaceous, found feeding on adult *S. aurantii* on orange on tree", 1 female; 28-III-1940, "on orange foliage", 3 females.

The present species very closely approaches *sorghi* Bagnall, from which it is very difficut to separate it by Bagnall's meagre description; it may perhaps eventually prove to be an aberrant form of that species. It at present appears to be a connecting link between *sorghi* and *cahirensis* (Trybom). It agrees with both these and other species belonging to the group in not having a plumose fringe of the wings, in having one sense cone on antennal segment III and an unarmed tarsus in the female. It agrees with *cahirensis* in the somewhat richer number of duplicated cilia on the fore wing (8-12 in the female, only 6-7 in *sorghi*); in the comparative lengths of the respective antennal segments it comes between these two species, the segments being somewhat shorter than in *cahirensis* but longer than in *sorghi*. The post-ocular setae are more or less the same length as those of *sorghi* but the epimeral setae are usually longer than in that species, though shorter than in *cahirensis*. In the description of *sorghi*, Bagnall mentions that the colour of the legs is similar to that of *cahirensis*, so that the present species must have darker fore tibiae because *cahirensis* has only the base dark whereas in *bedfordi* only the apex is yellow.

Elaphrothrips laticornis sp.n. (Figs. 13 and 14).

Female (macropterous): length 3.67 mm. distended. General colour dark brown. Head dark brown, darkening to blackish brown between the eyes and on the projection in front of them. Antennal segments I and II dark brown, paler and with a yellowish tinge at the base of the former and at the apex of the latter; III ochreous yellow, with the extreme apex tinged with pale brown; IV-VIII dark brown, IV very slightly paler than the rest for about the apical half. The prothorax and the pterothorax dark brown, a shade darker than the greater portion of the head. Abdominal segment one dark yellowish brown, the remaining segments dark brown, segment two about the same shade as the head, thence the segments gradually becoming darker until nine which is almost black; the tube almost black. The legs coloured as follows: all coxae dark brown; all femora dark brown with their extreme bases paler brownish yellow; all tibiae dark brown with their extreme bases paler brownish yellow; tarsi dark greyish brown. Wings completely hyaline except the extreme base of the fore wings which is tinged with brown, no dark longitudinal line present. All setae hyaline or pale yellow, except the terminals on the tube which are tinged with pale brown. Mesodermal pigment scanty, where present red.

Head about 2.20 times as long as its greatest width, which is within the basal half of the head, and 2.31 times as long as the width across the eyes; distinctly produced in front of the eyes, the process about 1.46 times as wide at its base as its median length, 0.34 as long as the greatest width of the head and distinctly narrower at its base than at the origin of the antennae, where it is about 1.69 times as wide as long. Tempora behind the eyes practically absent. The cheeks diverge evenly a short distance from the base of the eyes to near the base where they abruptly converge to the basal collar; the length of the cheeks about 1.82 times as long as the least width of the head which is a short distance behind the eyes. Vertex of the head not overhanging. Anteocellar setae, which are slightly knobbed, at least 67 μ in length. Post-ocular setae also slightly knobbed, at least 79 μ long, 76 μ apart and about 21 μ from posterior margin of the eyes. Dorsocephalic setae about 62 μ apart and 118-121 μ from the posterior margin of the eyes. Cheeks with five or six pairs of rather insignificant, blunt spines, the one immediately behind the eyes being the longest (about 22 μ). Eyes prominent, evenly curved from the fore margin to near the hind margin where they abruptly curve towards the head; about 0.23 the length of the head. The actual measurements of the eyes and ocelli are given under the male which has been cleared in sodium peroxide. The antennae rather stout, about 1.46 times as long as the head; segment III about 4.03 times as long as wide, and 1.23 times the length of IV which is itself 3.19 times as long as wide and 1.06 times as long as V. Sense cones slender, short (outer one on III about 40 μ), distributed as follows: III 1(1), IV 2(2), V $1^{+1}(1^{+1})$, VI $1^{+1}(0^{+1})$, VII one on dorsum. The shapes of the antennal segments and their chaetotaxy is as in the figure. Mouth cone short, labium broadly rounded, but the labrum rather sharply pointed, not overreaching the apex of the labium.

Prothorax along the median line of the pronotum about 0.41 the length of the head and (including the coxae) about 1.94 times as wide as long; epimera not fused with the pronotum; all usual setae present, knobbed, measuring as follows in μ: antero-marginal c.33, antero-angular c.36, mid-lateral ?, epimeral 97, postero-marginal ?, coxal about 44. Fore legs rather enlarged, with no conspicuous thick spines at the basal angle of the femora; tibiae normal with most setae rather weakly developed; tarsi with no trace of a tooth, the inner margin being straight. Middle and hind legs normal. Pterothorax wider than the prothorax (including the coxae). Wings fully developed, the fore pair about 12.5 times as long as wide near the base or at the middle, slightly wider near the tip; 15-16 duplicated cilia present on the hind margin near the apex of the fore wing; three knobbed basal bristles present on the fore wing measuring as follows in μ: 51, 68, 156; a and b, and b and c being 18 and 31 μ apart respectively.

Abdomen rather slender, widest at segments three and four where it is wider than the pterothorax; the length of terga VII-IX 189, 178 and about 150 μ respectively. The lateral setae on all segments except the ninth knobbed, the longest on segments 6, 7 and 8, 143, 154 and 125 μ long respectively; those on segment nine 378 μ long, that is, longer than the tube which is about 0.6 times as long as the head and about 2.68 times as long as the greatest subbasal width which is itself about twice that near the apex. Terminal setae on the tube 311 μ in length and thus longer than the tube.

Measurements of female (holotype) in mm. — Length 3.67 (distended); head, median dorsal length 0.461, width across eyes 0.200, width at hind angles of eves 0.179, least width across cheeks 0.171, greatest width across cheeks 0.210, width at basal collar 0.192; head process in front of eyes, length 0.071, width at base 0.104, width at base of antenna 0.120; cheek, length 0.311; prothorax, median length of pronotum 0.189, width (including coxae) 0.367; pterothorax, width 0.400; fore wings, length 1.211, width near base 0.097, width near middle 0.097, width opposite duplicated cilia 0.102;

abdomen, greatest width (at segments III and IV) 0.500; tube length about 0.300, greatest basal width 0.112 least apical width 0.056.

Antennal segments . .	1	2	3	4	5	6	7	8
Length in μ	50	63	145	118	111	87	58	45
Width in μ	63	37	36	37	34	31	26	16

Total length of antenna 0.678 mm.

Male (brachypterous). Length 3.23 mm. In colour similar to the female. In structure it is similar to the female but differing as follows (additional structural characters have been included which are visible in this specimen on account of its having been cleared in sodium peroxide): head relatively longer, 2.35 as long as greatest width and 2.50 as long as width across eyes. Head projection not so noticeable wider at the base of the antennae than at its own base, and somewhat longer, 1.44 and 1.59 times as wide at base and at base of antennae respectively as long and 0.37 as long as the greatest width of the head. Cheeks longer, 2.03 times as long as the least width of the head. Surface of head with fine cross lines, clearest at the base of the head and completely disappearing in front of the posterior ocelli. Eyes 0.23 the length of the head, measuring as follows in μ: dorsal length 100, width 53-58, interval 66; ventral length 90, width 47-50, interval 78. The hind margin of the posterior ocelli placed in a line which would mark off about the anterior third of the eyes, these ocelli being about 45 μ apart and 45 μ from the median ocellus; their diameters being 13 μ for the posteriors and 12 μ for the median one. Interocellar setae knobbed, about 53 μ long and 51 μ apart; immediately behind each posterior ocellus a post-ocellar seta is present which is 32 μ long and more or less at the inner posterior angles of the eyes there is another pair of setae somewhat shorter and weaker than the post-ocellars. Post-ocular setae well developed and knobbed, 92 μ in length, 84 μ apart (thus somewhat farther apart than in the female) and about 21 μ from the hind margin of the eyes. Dorso-cephalic setae rather weak, 45 μ long, 55 μ apart and 136-143 μ from the hind margin of the eyes. All cheek spines weak, rather more blunt than knobbed, that immediately behind the eyes the longest (26 μ) and strongest. Antennal segments as follows: III about 4.24 times as long as wide and 1.24 times the length of IV which is 3.14 times as long as wide and 1.08 the length of V; no prominent, straight knobbed setae on segment III as is sometimes the case in males.

Prothorax, along the median line of the pronotum 0.43 the length of the head and, including the coxae, 1.91 times as long as wide; all usual setae present, knobbed, measuring as follows in μ: antero-marginal 47, antero-angular 53, mid-lateral 68, epimeral 80, postero-marginal 80, coxal 49. Surface of pronotum smooth, median thickening weakly developed. Pterothorax narrower than the prothorax (including the coxae). Fore legs not greatly enlarged, "sickel-shaped" spine at apex of femur absent, spines on outer basal angle of femur thick and blunt, about 36 μ long; fore tibia with a very weakly developed thickening on the inner surface near the apex; fore tarsus with a basal, forwardly directed tooth which is shorter than the width of the tarsus. Middle and hind legs normal. Wings represented by short pads, the fore pair each having two knobbed bristles measuring as follows in μ: 37 and 52.

Abdomen wider than the pterothorax but narrower than the prothorax (including the coxae), widest at segment two, thence narrowing gradually to the tube; the pores on terga two to six, 37, 38, 30, 36 and 37 μ apart respectively. Terga seven to nine 164, 164 and 128 μ long respectively. Setae on segments similar to those of female, those on six to eight 113, 129, 120 μ in length respectively, those on segment nine 289 μ long, thus longer than the tube which is 0.56 the length of the head, 2.48 times as long as greatest subbasal width and this width 1.98 the least apical width. Terminal hairs on the tube 256 μ long in the case of the longest, the rest being mostly about the same length as the tube.

Measurements of male (allotype) in mm. — Length 3.23 (distended); head, median dorsal length 0.433, width across eyes 0.174, width immediately behind eyes 0.151, least width behind eyes 0.148, greatest width behind eyes 0.184, width at basal collar 0.177; head projection in front of eyes, length 0.068, width at base 0.096, width at base of antennae 0.108; cheek, length 0.300; prothorax, median length of pronotum 0.189, width (including coxae) 0.361; pterothorax, greatest width 0.322; abdomen, greatest width (segment II) 0.339; tube, length 0.241, greatest basal width 0.097, least apical width 0.049.

Antennal segments . .	1	2	3	4	5	6	7	8
Length in μ	50	63	140	113	105	82	55	46
Width in μ	53	34	33	36	34	29	25	16

Total length of antenna 0.654 mm.

Zululand: near Lake Sibaya, 21.XI.1939, sweeping (*W. G. H. Coaton*); one macropterous female and one brachypterous male.

The present species appears to be most closely related to *Elaphrothrips distans* Bagnall described from Morogoro, Tanganyika Territory and *E. separatus* Priesner from Amani, Tanganyika Territory. From the latter the present species may easily be separated by the thicker antennae; segment III, 4.03-4.24 times as long as wide (as compared with 4.8 in *separatus*), IV, 3.14-3.19 times as long as wide (4.0 in *separatus*), III being 1.23-1.24 times as long as IV (compared with 1.1); the complete absence of a tooth on the fore tarsus of the female; the smaller number of duplicated cilia on the fore wing, 15-16 as compared with 31. From *distans* it may be separated by the smaller number of duplicated cilia, 15-16 as compared with 27-28; the shorter postero-marginal bristles on prothorax, 97 as compared with 158 μ; head distinctly wider across cheeks than across eyes, these widths being equal in *distans*; the relatively broader antennal segments, III, 4.03-4.24 and IV, 3.14-3.19 times as long as wide compared with 4.38 and 4.0 respectively in *distans* and II, 1.23-1.24 times as long as IV, compared with 1.09; the relatively shorter head 2.20-2.35 times as long as greatest width compared with 2.6

Records and descriptions of South African Thysanoptera — II.

by

J. C. Faure.

Arhipidothrips brunneus spec. nov. (figs. 1-3).

Female (macropterous). Length 1.8 to 1.9 mm. (distended). *Colour*: general colour brown, wings banded, first four antennal segments almost white. Head brown, eyes so dark red as to appear black, mouth-cone and palpi brown. Antennae: i very pale grey, ii, iii and iv practically white, transparent; pedicel of iii yellow; extreme base of iv (about 3 μ) grey, and about 3 μ at apex of iv tinged with very pale brown; v to ix light brown, viii and ix slightly paler, v with sub-basal paler yellowish band about 4 μ in length.

Prothorax slightly paler than head, with bright red hypodermal pigment. Pterothorax about as dark as head at sides, dorsal aspect largely yellowish brown. Wings: fore-wing with three grey-brown transverse bands, of which the middle one is darkest, as illustrated; hind-wings: scale grey, apical third faintly greyish, basal two-thirds clear. All legs brown, about as dark as head, except tarsi yellowish brown, hind coxae yellow, all trochanters and extreme bases of all femora yellow.

Abdomen: i yellow, tinged with brown, with white hypodermal pigment visible over black paper; ii to ix uniformly light brown, about like prothorax, with transverse lines of bright red hypodermal pigment in intersegmentalia between iii to ix; x and xi greyish yellow; bristles at apex yellowish brown.

Head wider than long, the length about 0.9 of the width near base; head about 0.9 as long as prothorax. Eyes prominent, moderately bulging, their dorsal length about 66 μ, ventral length 112 μ; broadly rounded on inner dorsal posterior angles, strongly